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Abstract In this paper, we're proposing a new way on constructing a Theory of Everything. By supposing that gravitational effects form particles and gravity is completely different from other three fundamental forces, we're able to unified Quantum Mechanics and General Relativity. This theory focuses on how this theory could describe Quantum Mechanics and General Relativity without contradiction and demonstrating how Quantum Mechanics could be derived from classical physics, exact formulas on how this theory work will require deeper research. In this paper, we've also gave explanations on how cosmological inflation happened, how particles formed at the early stage of the universe.

Keywords Theory of Everything · Quantum Mechanics · Gravity

1 Axiom of Continuous Spacetime

Before starting this theory we'll have to remind you that this whole hypothesis, is actually built completely upon one axiom, that's all fundamental mechanisms[1] must be a smooth function[2]. There's no reason why a world should be so, it's just that with this suppose we're able to derive the idea of Le-point (see Sect. 4), and with the idea of Le-point allows us to merge quantum mechanics with the classical physics.

1.1 Indivisible Connection

Since the 4-D function of the universe (the function that tells you what is there at a given position and a given moment) are by definition smooth functions due

[1] The definition of fundamental mechanisms will be every input systems of every modules the universe consists. The idea of module will be introduced at Sect. 3

[2] We're not sure if all functions are C^∞ functions, but at least they need to be smooth to an enough order so that the derivations within this theory could apply.

to how it's used later in the theory. You could conclude that once two things are connected somehow (like spatially overlapped), then that connection could no longer be removed, instead it could only be weakened so much that's ignorable. As differential equations of these systems must also be continuous, which means you could always find some region of the line (even if it's infinitesimal short) that's connecting the two major chunks that you seem to have split. This axiom might at first seems counterintuitive and contradicting with our daily life experience, but it'll all get resolve when you dive into how microscopic world works in this theory. A quick spoiler is that you could technically cut things in half using the idea of Le-point (as explained in Sect. 8) because the world we **see** isn't actually one of the fundamental mechanisms. The space itself surely is, but things that we see technically aren't, as we'll explain more in the Sect. 9

2 Equality Principle

Before starting the theory, we'll have to define some terms and the rule of derivations. Starting with terms, the term "dimension" is widely use in this theory but with a slightly broader meaning. The term dimension refers to any units, which includes not only the spatial dimensions but also properties such as mass, temperature, spin, etc. So "Dimension" and "unit" are basically interchangeable within this theory. The reason we define dimension as this is because of our rule of derivations, the rule is that unless two things could be proven to be different (hence contradiction with experiments occurs), they should be treated equally.

3 Module

A Theory of Everything is aimed to describe everything, from the tiniest thing to the largest thing. In this theory, we describe things by first deconstructing them into tiny little sections that only contains one cause and a corresponding effect, then combine them back. For example, when throwing a ball, the movement will be deconstructed into three main parts[3]: gravitational effect, air friction, and the acceleration from the force you gave when you threw it. For each of these parts, which can't be divided further[4], we called them a cause-effect scene.

In this section, we're only talking about classical physics (excluding any quantum related stuff), cause in the later sections we'll show you how we derived quantum mechanics from our description of classical physics. So if only considering classical physics[5], any cause-effect scene could be categorized as either change in position or change in perspective, where the only theory that'll be categorized as change in perspective should be Einstein's theory of Relativity.

Now we're going to create a template called Module, that is aimed to be able to describe both categories' cause-effect scene. The module consists 4 variables:

[3] Three "main" parts, because not sure if there's other things effecting it. But even if there is, it is ignorable in this case.

[4] We knew some parts could still be divided into subatomic interactions, but it isn't quite useful for doing that and we think it could be simplified

[5] Which here includes the classical version of electromagnetic.

1. s, the environment variable.
2. Z, the origin of the module's virtual perspective.
3. T, the unit length of the module's virtual perspective.
4. x, the output of the module.

By inputting the input variables (s, Z, T) to the module, it will map the environment (base) state s to an output state x with the following equation:

$$x = \frac{s - Z}{T} \tag{1}$$

Which basically mean x is the value s viewed from the virtual perspective whose origin is at Z with a unit length of T. By this definition, the Module could describe changes in perspective by changing the unit length of the virtual perspective, and changes in position could be described by moving the origin of the virtual perspective.

But many of you might ask, why describe changes in position by moving the origin but not the environment state. That's because unlike the virtual perspective (Z, T) which is by definition dynamic systems, s is static for a basic cause-effect scene. The only case s would be dynamic is when a module is connected to another module. For example, when you want to describe gravitational effect upon (classical) electromagnetic effect, then the environment variable s of the gravity module will be the output of the electromagnetic module. And the action of connecting modules is the same as how we will just add up force vectors to get the resultant force, you're adding the gravitational force effect upon the electromagnetic force effect.

Also a module could use to describe higher dimensions' cause-effect scene (like 3-D spatial movements) by simply inputting corresponding n-Dimension fields for all 3 input variables. We're just using 1-Dimensional module as an example of how it works.

4 Le-point

If you remember our only axiom, that every input systems of a module has to be continuous, you should quickly notice that our definition of module might cause a bit of issue. Because that:

1. T must be continuous.
2. Even 1-Dimensional plot has two directions, and most of the time those two directions aren't special (or that they're symmetric). For example, on a 1-D line, you could define your right hand side as positive, but you could also define it as negative and it won't cause any issue.

And since T could also be negative (which act like mirroring the dimension), it means that T must be exactly 0 sometime during the transaction from positive T to negative T[6] or vice versa. And that will cause division by 0 so we've got to

[6] We know this might just won't happen or could be prevented if the axiom doesn't exist, but as we say by introducing this idea gives us a way to interpret quantum mechanics, we'll take it anyway.

resolve it, but not by rewriting our definition of module, but redefining what does division by 0 actually does.

Here's the proof that people use to prove that division by 0 will create contradiction and therefore should be forbidden. First start with the assumption that

$$0 \times 1 = 0 \tag{2}$$

and

$$0 \times 2 = 0 \tag{3}$$

then the following is true

$$0 \times 1 = 0 \times 2 \tag{4}$$

Dividing both sides by 0 gives

$$\frac{0 \times 1}{0} = \frac{0 \times 2}{0} \tag{5}$$

$$\frac{0}{0} \times 1 = \frac{0}{0} \times 2 \tag{6}$$

Which yields

$$1 = 2 \tag{7}$$

To resolve this issue, you'll need to first rearrange our module's equation to $x * T = s - Z$, by doing this the division by 0 isn't a normal division by 0 anymore, but rather has a more intuitive meaning. By setting $T = 0$, it means that the space for that virtual perspective is destroyed. Cause for all possible points in the virtual perspective (which is all possible x) all yields the same s. So the entire perspective only maps to a point that outer observers observes[7]. In other words, that perspective actually has no spatial-ness. And that's the key, no spatial-ness means the virtual perspective's all dimensions are squashed into one point, leaving that point unit-less as you can't differ one dimension from another within that single point. And we named these points created through division by 0, Le-points.

Le-points by definition are unit-less, but not because they're canceled out (like ratios), but that they're destroyed. And since all calculations must have a unit somewhere when used to describe physics, we would say that Le-points are incalculable when used in physics. So if Le-points are incalculable, then the Equation 6 is incorrect. Cause if you treat the 1 and 2 in the equation 6 as scales (unit-less), they can't multiply with $\frac{0}{0}$ which is also unit-less. And you can't treat $\frac{0}{0}$ as scale, cause only dimensions will encounter the division by 0 issue as that's what modules are describing. By now we've prevent the contradiction from happening (as long as it's used to describe scientific stuffs).

In fact, dividing anything by 0 should give you the same Le-point, as you couldn't actually discuss the different between Le-points when they're dimensionless. To compare properties of things you'll always have to be on the same dimension (much like you can't subtract weight with height). So we could conclude that Le-point has, by definition, no distant between any point in any dimension (even between Le-points themselves), or at least not those dimensional distant we're talking about.

[7] The outer observers here refer to the perspective whose $(Z, T) = (0, 1)$.

5 Shifting Mechanism

First we'll have to know that anything that's within Le-point is unreachable by things outside Le-point, because when things enter Le-point its property (units) will get destroyed, hence making it un-interact-able (as interaction are basically same as calculation). But that doesn't mean those things lost its properties, it's just that it can't be observed and interact with. Those properties are still preserved by the relative distance between the environment state variable s and the origin of the virtual perspective Z. For everything that's within the Le-point, there's a shifting mechanism that's randomly shifting the value of s, Z and T[8]. The reason behind this is the same as why heat always spreads out and why entropy can never decrease. The mechanism is just shifting things more quickly and significantly because everything is squashed into a single point. Or you could think of that the Le-point by itself, since it's only a point, couldn't carry that much of (useful) information. By now we're still not sure how does it work (like whether or not the shift is real random) or why does it work like this, so you could either just take it or think of it as just an idea extended from the idea of Entropy.

6 The Idea of Existence

The definition of Existence is that it is what keeps things out of Le-point, which means that the amount of Existence one thing received (denoted as E) is proportion to the absolute value of T when T isn't a changing dynamic system but rather a fixed constant. Everything will propose (emit) a certain amount of Existence by itself which is proportion to its structural uniqueness[9], spreading out by Spatons or Le-point.

Existence that's spreading through Spatons is easy to describe. The strength of the Existence transfered by spatons will drop the further away it traveled, as since the Spatons are also outside of Le-point, they'll consume part of the Existence while transferring it.

On the other hand, Existence spreading through Le-point could spread to any other thing even if it's light years away[10]. But in order to exchange Existence between two things, those two things must first be in Le-point simultaneously to establish what so called connection through Le-point (or tunnel). A tunnel is established when two points are simultaneously within Le-point because once they're at a same point, you could never disconnect them (as explained in Sect. 1.1). But still the tunnel that's used to transfer Existence will fade away as time passes due to the Shifting Mechanism that's destroying the structural uniqueness of the tunnel, and when the tunnel totally blends into the other stuff and random noises

[8] T could also be slightly shifted as long as it's smaller than MREE, an idea that'll be explained later in Sect. 7.

[9] By definition, the amount of Existence proposed by the throughly mixed noise within Le-point is near 0, and the shifting of T caused by the shifting mechanism is due to some arrangement of noise within Le-point might propose higher Existence.

[10] Transferring things through Le-point are considered as instantaneous as by definition there are no distance between any points and the Le-point. The fact that using Le-point could exchange things faster than light without breaking causality is also used in explaining quantum entanglement.

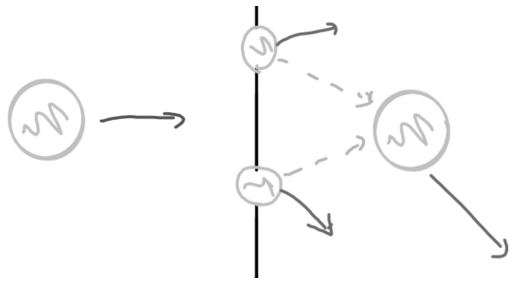

Fig. 1 How double-slit experient works

that's within the Le-point, the tunnel could be considered as disappeared and are no longer transferring Existence.

7 How Quantization is achieved

Planck uses the suppose that there's a minimum required energy in order to emit light of a specific frequency to solve the ultraviolet catastrophe. The suppose is that in order to emit high frequency light will require lots of energy and that's the reason why the Blackbody radiation spectrum drops at the high frequency side. With this suppose it means that you can't split light so that it's energy is lower than hf. And why this lower bound[11] exists could be explained by introducing the idea of Minimum Required Existence to Exists (MREE).

In previous section we've explain what Existence is and how it is exchanged. We've also said that the amount of Existence received is positively correlated to the unit length T, though that statement isn't completely correct. The correct statement is that E is positively correlated to T only when E is larger than the object's MREE. When a thing can't receive Existence more than its MREE, it simply won't leave Le-point[12].

The idea of MREE is derived using causality. A smaller T corresponds to longer distant between two points, and since the speed of light remains constant through any perspective. The MREE could be think of as the minimum required energy so that the particle would have a slightest chance to effect/be effect by something else. And only when a thing is interact-able, that it would be considered as outside of Le-point.

8 Where Quantum Randomness arises

The quantization of Energy is achieved by the idea of MREE in our theory. Taking photon as an example, imaging that you're dividing a photon using a knife, what'll happen is kind of like that you could slice a photon in half, but as soon as your

[11] In order to explain the drop of the radiance in the spectrum at the high frequency side, you only need a lower bound of energy. Light doesn't necessarily need to came in discrete energy packets.

[12] But it doesn't necessarily mean T equals to 0, as the shifting mechanism is allowed to shift T over time as long as, say it's proportion.

knife passes through they'll quickly rejoin. This temporal divisible property is very important, as it not only allows us to explain quantum related stuffs such as quantum randomness and wave-particle duality, but it also explains how we could divide things by taking use of Le-point.

First thing to know is that when light is quantized by applying MREE in our theory, it isn't as indivisible as it is in Quantum Mechanics. The idea of MREE only sets a lower bound of how much energy a thing must carries. Yet the source of Existence doesn't need to come from photon itself, as you'll see in Sect. 9 that everything are made from the same material. In this case, Existence may also be proposed from the barrier. That means when a particle reaches the barrier, it's split by the middle section of the barrier and go through both slit, as shown in the Fig. 1[13]. The photon could actually be split into two passing both slits, as long as they're receiving additional Existence from the barrier (hence contacting the barrier or at least not so far[14]). But as soon as two parts of split photon leaves the barrier, both of them immediately collapse through the Le-point, and the shifting mechanism will decide where the photon will reappear (as a whole) and where will it be heading. After that the photon will just keep flying in a straight line just as a normal particle.

The reason we're making this conclusion is that the interference pattern spreads when the screen is moved further. Which means it's possible that particles only act not-so-particle-like when they're passing though the slit, which randomly decide a position and momentum of a particle. And later on they'll just go straight as a normal particle would (resulting the spread of the pattern). Though we're still unsure from where it starts acting as a normal particle.

At last, by looking at many experiments and writing down their explanations, we've came to a conclusion that:

1. When a certain property only has finite (or discrete) possible (observable) outcome, superposition is equivalent to states where MREE can't be satisfied.
2. So when attempting to set a thing's property to superposition, the thing will collapse back to Le-point and an outcome will be chosen randomly by the Shifting Mechanism as it exits the Le-point.

And we believe this is why quantum randomness arises at subatomic realm.

9 Forming Particles from Gravity

Now let's start describing how gravitational effect is created using our theory. The current theory for gravity is Einstein's general theory of Relativity, which stated that gravitational effect appears due to curvature of spacetime. We'll be starting from there, but before we even try to curve the spacetime we have to know what spacetime actually is and why it could be curved.

In our theory, gravitational effects aren't created because particles exist, instead it's the gravitational effect that forms the particles. We think that space is

[13] The vertical black line is the barrier with slit, and the green arrows doesn't necessary represent the direction particles are moving.

[14] "Not so far" because spaton is also an Existence carrier (since particles are basically compressed spatons), yet it shouldn't last long. Also we're not even sure whether the spatons are stable or they're actually disappearing and reappearing.

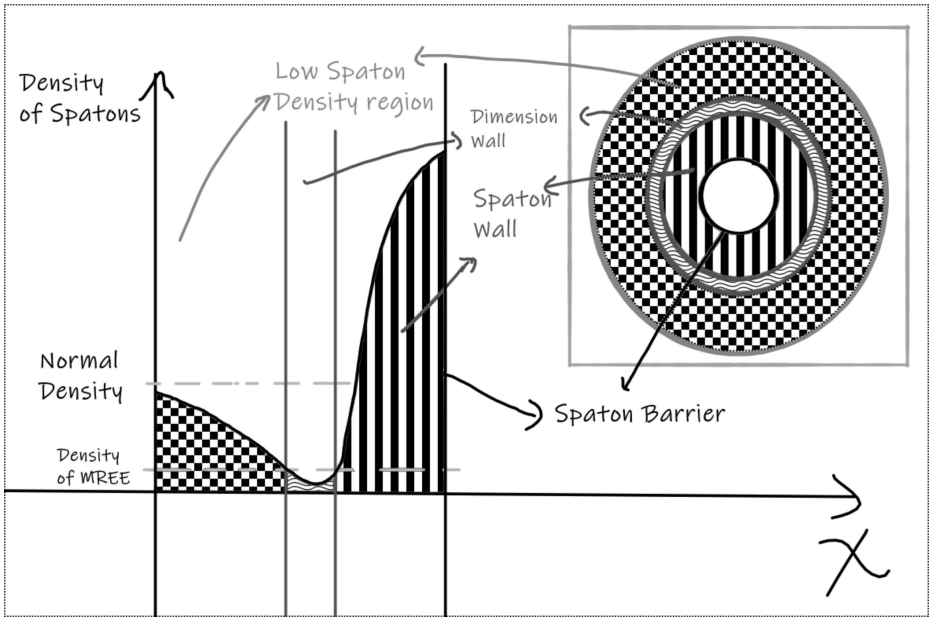

Fig. 2 Formation of Particle

a thing so called Spatons. And there's also a Spaton field (for analytics use) which is a density function of the amount of Spatons[15]. When the amount of Spatons is same everywhere, then velocity could be redefined as amount of Spatons traveled through in a given time[16]. With this definition you could accelerate things when it travels through a region by lowering the region's amount of Spatons.

So to create an everywhere attraction force toward a point, all you have to do is make the amount of Spatons of a region lower as they're closer to the point (the checkerboard "Low Spaton Density Region" shown in the Fig. 2, the acceleration will be toward right). And when an object is traveling through the checkerboard section (which extends to infinity), it'll experience acceleration toward the central point of the attracting object, as the density of spatons is getting lower while the velocity remains constant.

But since the Spaton itself forms the space, the total amount of Spatons are conserved as it has nowhere to go to. So the amount of Spatons that's lowered (removed) in the checkerboard region must go somewhere, and the most reasonable place they'll go to is the center point where everything is attracted to[17]. Cause

[15] The field is like a probability density function but instead of probability it's the function of the amount of Spatons. So to get the amount of Spatons within a region, you'll just integrate the function over that region.

[16] The speed of light will remain constant even with this explaination. Yes, speed of light would vary if only applied to this module. But after connecting to the module of special relativity, the module will act as a multiplier 0 which cancels out this definition of velocty, and the speed of light came from other places which ensures it to remained constant.

[17] The Spaton Wall and Spaton Barrier regions are actually all inside the center point, instead of a region that's drawn in the picture. The reason the picture is drawn like this is only because we're unsure whether the density will just rocket to infinite at the center or it'll behave in other ways so leaving an unsure region.

only by concentrating spatons into a point will make such curve of density where the closer to the center the lower it is, consider that you couldn't push spatons to infinite far as no infinite far could be definitely further than the infinite range of gravitational effect.

The thing that makes particles different from Spatons is that particles have some properties that Spatons (or space) doesn't have, like mass. Then how could you create particles out from Spatons when space itself doesn't have those properties? Well by what so called Dimension Wall (the middle section with wave pattern). When the density gets too low[18] that the received Existence is lower than MREE, new dimensions (properties) will be created. Because space can't just disappear as if every particle will have a strip of disappeared space surrounding them we should've noticed them. But if they didn't just disappear, then there must be extra source of Existence in order to keep space exists. The extra Existence is received from other newly created dimensions within the region of Dimension Wall. If there are additional dimensions that are created in that region, and in that newly created dimension values are relatively close, we could explain why that region of space could propose enough Existence for itself to exists. With this, we could also explain why Bekenstein bound is proportion to an object's surface area, as the information of an object is mainly contained in the region of dimension wall[19], which is proportion to the object's surface area. And now you know how to make a particle by concentrate enough Spatons into a single point.

10 How Cosmological Inflation started

If the Cosmological Constant is positive, which means the speed of expansion is accelerating, then the expansion force will eventually be so strong that it'll rip everything apart. But not only it'll rip everything back to elementary particles, it'll also rip elementary particles back to spatons. And if the cosmological Constant is still positive when everything is ripped back to spatons[20], then eventually spatons will be so far from each other (in other words, the density of spatons will become so low), that everything falls back to Le-point. This final collapse should collapse literally everything back to the Le-point at the same time, as before this happens there should be enough time that those chunks of Spatons which are no longer particles to spread out evenly, so that the density of Spatons is equal everywhere[21].

[18] Spatons doesn't actually gets further away from each other when density drops, it just gets thinner and thinner. Spatons isn't actually particles, but rather more field-like, it's just easier when described as particles.

[19] Within the dimension wall is just basically highly compressed spatons, which shouldn't contain much information. Another place where information could be stored, is how an object propagate in space (which is how Quantum Superposition is achieved).

[20] Which should still be true considered how we explains the mechanism of the expansion of the universe, but if the expansion isn't just driven by our explanation but also by dark energy (which isn't a part of our theory for now, because isn't needed), then this statement will have to be reconsidered. Because we're not sure whether or not dark energy is made from spaton or not, and if it'll be destroyed.

[21] But even if everything doesn't collapse back to Le-point at the same time, it just means that the next universe won't have same amount of energy as we have and also multiple universe might form from the remain of a previous universe. Yet no matter what, it doesn't affect later explanations.

After the final collapse everything should just exit Le-point as what particles will normally do when they collapsed through the Le-point (see double-slit explaination in Sect. 8). Except the fact that this time the whole universe falls through the Le-point at the same time, which creates connections through Le-point between everything of the entire universe. The extremely high Existence proposed by those connections, makes their virtual perspectives' unit-lengths enormous. And as them exit the Le-point with such enormous unit-lengths, they don't just return to the positions before they entered the Le-point, instead they came out extremely close to each other. And this is the start of another universe.

Since connections through Le-point decays quickly through time, that enormous Existence proposed by those connections and everything's virtual perspectives' unit-length drops quickly over time too. As the unit-length drops, the space observed by things inside the universe expands exponentially. And this is the cosmological Inflation.

11 Formation of Particles during the start of the Universe

Now you might wonder, if before the final collapse Spatons are smoothly spread out, then how are particles created? During the final collapse where everything is still in the Le-point, the Shifting Mechanism actually disorder the smoothly spread Spaton field, forming some regions that have higher density of Spatons. Before Inflation kicks in, those slightly denser regions are still spatons, same as other less dense region, as all those regions are still relatively close to each other that they could share Existence proposed by each other. But when Inflation started which move those regions way apart from each other, self-proposed Existence isn't enough and dimension walls formed, making the first batch of particles.

By looking at how the universe developed, we could clearly see what does "Excitation of Quantum Field" means. Excitations of Quantum Field corresponds to formation of particles in Quantum Field Theory. And the creation of particles in our theory, is achieved by concentrating spatons. So swapping terms, Excitation of Quantum Field corresponds to concentrating spatons. Or more generally speaking, the energy level of a Quantum Field and the density of spatons are highly connected.

12 Quantum Entanglement

Quantum entanglement is one of the biggest problem for theories that doesn't accept the idea of superposition such as this one. So the way we explain quantum entanglement is by using temporal memorization by Le-point. Whenever a thing enters Le-point, it'll create connections through Le-point with whatever things that are in Le-point at that moment. That means even when particles exit Le-point it could leave some dent that contains its information within Le-point. Of course those dent will fade away quickly due to the Shifting Mechanism, it's still enough for us to explain entanglements.

We know when preforming observations (or in other words, collapsing the quantum superposition), the particle must temporarily enter the Le-point so that it would only output limited (discrete) possible outcomes and also the randomness

we observed (as explained in the final paragraph of Sect. 8). So entangled particles could share their outcomes (that's going to be observed) by leaving temporal dents in the Le-point so that the later entering particle could output the result that matches the experimental results[22]. And if two particles are entering Le-point at the exact same time, then they won't even need to use the temporal dent to exchange information, but rather they could've directly exchange their information while they're within Le-point.

Acknowledgements Thanks for all my friends and love ones who supports me and believes in me during these years of the development of this theory. Without them I would've gave up already. Huge thanks to them.

[22] Remember that the outcome is decided right before the particle exit the Le-point.